Selecting similar units for the CMP Quarterly Quality Report

In the Case Mix Programme Quarterly Quality Report (QQR), each critical care unit is compared with all other adult critical care units participating in the Case Mix Programme and also with a group of similar units. This document describes the process used to select the group of similar units for reporting in the QQR.

Specialist units

For critical care units in the following categories, similar units are all other critical care units in the same category:

- specialist neurosciences critical care units;
- combined general and neurosciences critical care units;
- specialist cardiothoracic critical care units;
- standalone high dependency units; and
- non-NHS (independent sector) critical care units.

For the one specialist liver critical care unit, the similar units are adult general critical care units with at least 10% of admissions having a liver-related condition as either the primary or secondary reason for admission to the critical care unit.

For critical care units in specialist cancer hospitals, similar units are adult general critical care units with at least 10% of admissions having either metastatic disease or haematological malignancy in their past medical history.

General units

All other critical care units are split according to teaching status (whether the unit is located in a university or non-university hospital) and similar units are selected from within the teaching status category according to how similar they are on the following factors:
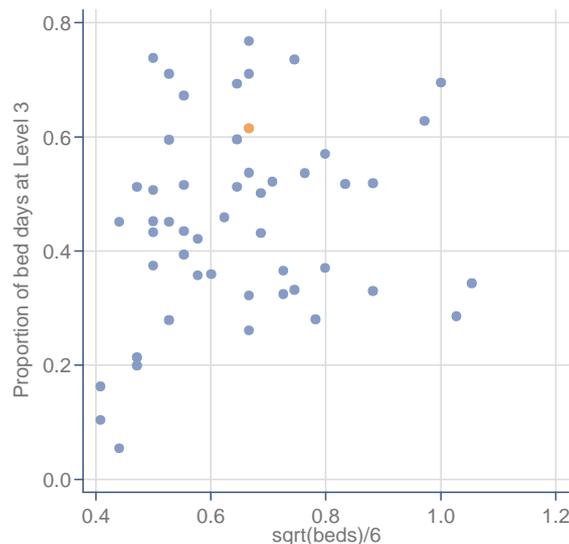
- the number of beds in the unit (square root transformation with weight 1/6);
- the number of admissions per bed per quarter (with weight 1/36);
- the proportions of admissions following elective surgery, emergency surgery and non-surgical (with weight 1); and
- the proportion of bed days of care delivered at Level 3 (with weight 1).

Each of the above values is calculated for each unit based on the data for the current year to date. The exception is Quarter 1 (April to June) reports, where, if units are yet to validate their Quarter 1 data, the last quarter of the preceding year is used. The distance between the unit on which the report is being run and all other units is calculated and all units that are within a distance of 0.2 for non-university hospitals (0.4 for university hospitals) are selected as similar units. If this does not identify at least 10 similar units, then the distance is increased up to a maximum of 0.5 for non-university hospitals (0.8 for university hospitals) until 10 similar units are identified.
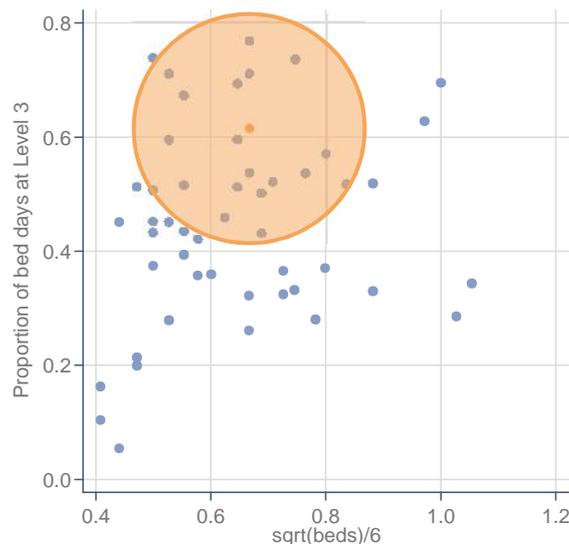
Example

The following example illustrates the approach using only two of the above factors (number of beds and proportion of bed days at Level 3). Suppose we are running a report for a 16-bed general critical care unit in a university hospital for the period 1 April to 30 September 2015.

1. Load all data from general critical care units in university hospitals from 1 April to 30 September 2015 and calculate for each unit:
    - ○ the square root of the number of beds divided by 6; and
    - ○ the proportion of bed days of care delivered at Level 3.

2. We can plot the values of these two factors for each unit in a scatter plot. The point for the unit whose report we are running is highlighted in orange:

3. Similar units are selected by drawing a circle around the orange point. The example below uses a distance of 0.2 (note that using more factors requires a larger distance):

4. The similar units are all units within the shaded orange circle. If the circle did not include at least 10 units, we would make it larger until 10 units were included (or the maximum distance was reached).